

## CLAIMS

1. A method for transplanting lymphohematopoietic cells into a mammal, which comprises the step of injecting cells into a bone marrow cavity, and wherein the cells have an exogenous gene encoding a receptor that induces cell proliferation in response to ligand binding.
2. The method of claim 1, which lacks the step of marrow conditioning before injection of the cells.
3. The method of claim 1, wherein the exogenous gene has been introduced into the cell using a viral vector.
4. The method of claim 1, wherein the receptor is a chimeric protein having (a) an extracellular domain of a receptor that dimerizes the chimeric protein in response to ligand binding, and (b) a growth signal generator that induces cell proliferation in response to the dimerization.
5. The method of claim 1, wherein the receptor has a cytoplasmic domain of a hematopoietic cytokine receptor.
6. The method of claim 1, wherein the receptor has a cytoplasmic domain of a thrombopoietin (TPO) receptor or a granulocyte colony-stimulating factor (G-CSF) receptor.
7. The method of claim 1, wherein the receptor has an extracellular domain of an erythropoietin (EPO) receptor.
8. The method of claim 1, wherein the cell is a pluripotent stem cell.
9. The method of claim 1, wherein the mammal is a primate.
10. The method of claim 1, wherein the method comprises the step of administering a ligand of the receptor into the mammal.

11. The method of claim 1, wherein the cell comprises a vector having a therapeutic gene.

12. A bone marrow transplant comprising (a) lymphohematopoietic cells having an exogenous gene encoding a receptor that induces cell proliferation in response to ligand binding, and (b) a pharmaceutically acceptable carrier.

13. A kit for transplanting lymphohematopoietic cells into a mammal, which comprises (a) a vector encoding a receptor that induces cell proliferation in response to ligand binding, and (b) a recording medium describing the use of the vector and lymphohematopoietic cells introduced with the vector for injection into the bone marrow cavity.

14. A gene encoding a fusion protein comprising (a) a ligand-binding domain of erythropoietin (EPO) receptor, and (b) a growth signal generator that imparts proliferation activity to a cell upon the binding of a ligand.

15. The gene of claim 14, wherein the growth signal generator is a cytoplasmic domain derived from the granulocyte colony-stimulating factor (G-CSF) receptor or thrombopoietin (TPO) receptor.